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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,342	03/26/2004	Raymond H. Bryden	1035-R4303	8212

34456 7590 08/06/2008  
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EXAMINER
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O HERN, BRENT T

ART UNIT	PAPER NUMBER
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1794

MAIL DATE	DELIVERY MODE
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08/06/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/810,342	<b>Applicant(s)</b> BRYDEN, RAYMOND H.	
	<b>Examiner</b> Brent T. O'Hern	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 40-48,50,57-63 and 70 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 40-48,50,57-63 and 70 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claims***

1. Claims 40-48, 50, 57-63 and 70 are pending.

### ***Information Disclosure Statement***

2. The IDS filed June 1 2007 listing a publication in Chinese is acknowledged, however, it is noted that Applicant has not particularly pointed out any relevant portions thereof or provided an English translation of any portions thereof, thus, the Examiner takes the position that there is not anything in the reference that the Examiner should consider.

## **WITHDRAWN REJECTIONS**

3. All rejections of record in the Office Action mailed 18 December 2007, pages 3-5, paragraphs 9-13, have been withdrawn due to Applicant's amendments in the Paper filed 18 June 2007.

## **NEW REJECTIONS**

### ***Claim Rejections - 35 USC § 103***

4. Claims 40-42, 44-48, 50, 57-60 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonntag (US 6,143,239) in view of Hida (US 4,948,761).

Regarding claim 40, Sonntag ('239) teaches a ceramic component (*See col. 1, l. 7.*) comprising a ceramic body comprising silicon carbide (*See col. 1, l. 8.*) and an oxide layer (*See col. 4, ll. 38-53 and col. 2, ll. 53-57.*) the oxide layer containing an amorphous matrix phase comprising silica (*See col. 3, ll. 25-55 where the amorphous matrix with "part crystalline" comprises silica, SiO<sub>2</sub>.*) and a crystalline phase provided in the

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amorphous matrix phase (*See col. 3, ll. 25-49.*), the crystalline phase comprising alumina (*See col. 4, ll. 38-48, alumina  $Al_2O_3$ .*), the amorphous matrix phase and the crystalline phase forming an adherent, conformal layer that resists spalling and flaking and functions to passivate and protect the ceramic body from excessive oxidation (*See col. 3, l. 25 to col. 4, l. 49 where the material adheres and conforms to the substrate and resists spalling and flaking to at least some degree and passivates and protects the ceramic body from oxidation to at least some degree which is not excessive.*), however, fails to expressly disclose a crystalline phase with anisotropically-shaped crystals.

However, Hida ('761) teaches using ceramics with anisotropically-shaped crystals (*See col. 2, ll. 20-28.*) for the purpose of providing crystals having very good strength properties (*See col. 2, ll. 38-43.*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Sonntag's ('239) component with crystals anisotropically-shaped as taught by Hida ('761) in order to provide a component having good strength.

Regarding claims 41 and 45-46, Sonntag ('239) teaches a ceramic component wherein the ceramic body comprises nitride bonded silicon carbide (*See col. 4, ll. 53-57.*).

The phrases "is formed by reacting a green body with nitrogen while heating, the green body containing silicon carbide and silicon" in claim 45, lines 1-3 and "wherein the green body is formed by slip casting a slurry containing silicon carbide and silicon, forming a cast, and drying the cast" in claim 46, lines 1-3 are **process limitations** in

product claims and hence given little patentable weight since patentability of a product does not depend on its method of production (*see MPEP § 2173.05(p)*). Furthermore, the above structure is either formed in such a manner or capable of being formed in such a manner.

Regarding claim 42, Sonntag ('239) teaches a ceramic component wherein the ceramic body comprises silicon carbide as a primary component (*See col. 1, ll. 46-53.*) and silicon nitride as a secondary component (*See col. 4, ll. 53-57.*).

Regarding claim 44, Sonntag ('239) teaches a component wherein the ceramic body has a porosity within a range of about 5 to about 25 vol% (*See col. 1, ll. 21-28.*).

Regarding claim 47, Sonntag ('239) teaches a component wherein the ceramic component is a refractory component (*See col. 3, ll. 42-44 and col. 1, ll. 19-21.*).

Regarding claim 48, Sonntag ('239) teaches a component wherein the refractory component is selected from a group of support posts, support beams, support plates, and containers (*See col. 1, ll. 19-21.*).

Regarding claim 50, Sonntag ('239) teaches a component wherein the crystalline phase includes the aluminosilicate, the aluminosilicate comprising mullite, the mullite having a composition  $3\text{Al}_2\text{O}_3\text{-}2\text{SiO}_2$  (*See col. 4, ll. 42-48.*).

Regarding claims 57-60, Sonntag ('239) teaches a ceramic body discussed above, however, fails to expressly disclose wherein the crystals are anisotropically-shaped with an aspect ratio not less than about 3:1/5:1, with a crystal size of about 0.2 to about 20 microns/ (0.5 to about 10 microns).

However, Hida ('761) teaches making ceramic composites where the crystals are anisotropically-shaped (*See col. 2, ll. 20-28.*), have an aspect ratio not less than about 3:1/5:1 (*See col. 2, ll. 22-28.*) and with a crystal size of about 0.2 to about 20 microns/ (0.5 to about 10 microns) (*See col. 2, ll. 20-28.*) for the purpose of providing crystals having very good strength properties (*See col. 2, ll. 38-43.*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Sonntag's ('239) component with crystals anisotropically-shaped and having the above dimensions as taught by Hida ('761) in order to provide a component with good strength.

Regarding claim 63, Sonntag ('239) teaches wherein the oxide layer is a surface layer (*See col. 4, ll. 38-41 and col. 1, ll. 37-40.*).

**5.** Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sonntag (US 6,143,239) in view of Hida (US 4,948,761) and Dussaulx et al. (US 4,990,469).

Sonntag ('239) and Hida ('761) teach the component discussed above, however, do not expressly disclose wherein the ceramic body comprises about 5 to about 35 wt% silicon nitride.

However, Dussaulx ('469) teaches wherein the ceramic body comprises about 5 to about 35 wt% silicon nitride (*See col. 1, ll. 42-45.*) for the purpose of providing a material exhibiting excellent thermal stability and excellent bending strength (*See col. 2, ll. 34-36.*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Sonntag's ('239) component with the

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above silicon nitride concentration as taught by Hida ('761) in order to provide a component exhibiting excellent thermal stability and bending strength.

6. Claims 61-62 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sonntag (US 6,143,239) in view of Hida (US 4,948,761) and Hillig (US 4,640,899).

Regarding claims 61-62, Sonntag ('239) and Hida ('761) teach the product discussed above and Sonntag ('239) teaches wherein the amorphous matrix phase comprises silica (*See col. 3, ll. 34-35 and 42-44.*), however, fails to expressly disclose about 10 wt% to about 50% (at least 12 wt%) alumina.

However, Hillig ('899) teaches making composites with about 10 wt% to about 50% (at least 12 wt%) alumina (*See col. 2, ll. 49-58.*) for the purpose of providing a structure exhibiting a high melting temperature and low thermal expansivity (*See col. 1, ll. 24-30.*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Sonntag's ('239) component with the above alumina concentrations as taught by Hillig ('899) in order to provide a component exhibiting a high melting temperature and low thermal expansivity.

Regarding claim 70, Sonntag ('239) and Hida ('761) teach the ceramic component discussed above, however, fail to expressly disclose wherein the amorphous matrix phase comprises not greater than about 25 wt% alumina.

However, Hillig ('899) teaches wherein the amorphous phase comprises not greater than about 25 wt% alumina (*See col. 2, ll. 49-58.*) for the purpose of providing a

structure exhibiting a high melting temperature and low thermal expansivity (*See col. 1, ll. 24-30.*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify Sonntag's ('239) component with the above alumina concentration as taught by Hillig ('899) in order to provide a component exhibiting a high melting temperature and low thermal expansivity.

### **ANSWERS TO APPLICANT'S ARGUMENTS**

#### ***Oath/Declaration***

7. The declaration under 37 CFR 1.132 filed 18 June 2008 by Raymond H. Bryden is insufficient to overcome the rejection of claims 40-48, 50, 57-63 and 70 based upon Sonntag (US 6,143,239), Hida (US 4,948,761) and Dussaulx et al. (US 4,990,469) as set forth in the last Office action because the distinctions argued are not claimed. The declaration is helpful.

8. In response to Declarant's arguments (*See paras. 4-9 of the Declaration filed 18 June 2008.*) that the average weight gain of the Sonntag ('239) sample is 40% greater than Applicant's sample when subjected to the same test, it is noted that the Examiner does not dispute such a finding, however, said property is not claimed. If such a property were claimed then the rejections of record would probably be overcome.

9. In response to Declarant's arguments (*See paras. 4-9 of the Declaration filed 18 June 2008.*) that Sonntag ('239) does not teach the layer being adherent, conformal and resist spalling and flaking, it is noted that the Examiner does not necessarily disagree that Applicant's product's properties may be different and possibly better in said regard,



however, Sonntag's ('239) product clearly has said properties at least to some degree. These relatively better properties are not claimed.

**10.** In response to Applicant's arguments (*pp. 5-6, para. #2 of Applicant's Paper filed 18 June 2008*) that the references do not teach the adherent, conformal and resist spalling and flaking properties per amended claim #40, it is noted that said arguments are discussed above.

**11.** As discussed above, the Examiner does not necessarily disagree that Applicant's product has different and better properties than disclosed by the reference of record, however, the distinguishing properties are not claimed.

**12.** Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brent T. O'Hern whose telephone number is (571)272-0496. The examiner can normally be reached on Monday-Thursday, 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brent T O'Hern/  
Examiner, Art Unit 1794  
July 31, 2008

/Elizabeth M. Cole/  
Primary Examiner, Art Unit 1794